



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/029,788      | 10/26/2001  | David M. Curran      | TI-29038            | 5683             |

23494 7590 07/14/2003

TEXAS INSTRUMENTS INCORPORATED  
P O BOX 655474, M/S 3999  
DALLAS, TX 75265

EXAMINER

ELEY, TIMOTHY V

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

3724

DATE MAILED: 07/14/2003

3

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/029,788

Applicant(s)

CURRAN ET AL.

Examiner

Timothy V Eley

Art Unit

3724

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

Art Unit: 3724

**DETAILED ACTION**

*Specification*

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

a. "and system" should be deleted.

*Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 3-5, 7, 8, 15, and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (APA) in view of Hakomori et al.

a. The APA teaches a method of reducing thickness of spin-on glass on semiconductor wafers by dissolving the added thickness of the spin-on glass by using a solvent to dissolve the outer two to three millimeters of the wafers so that the wafers can be handled by handling machinery.

b. The APA does not disclose reducing the thickness of the spin-on glass on semiconductor wafers by: rotatably mounting a

Art Unit: 3724

semiconductor wafer; positioning a grinding member proximate an outer edge of the semiconductor wafer; rotating the semiconductor wafer; rotating the grinding member; applying a chemical to the outer edge; and engaging the rotating grinding member with the outer edge of the rotating semiconductor wafer (applicant's claim 1). The APA also does not disclose reducing the thickness of the spin on glass on semiconductor wafers by: providing a chemical in a container; rotatably mounting a semiconductor wafer; bearing a grinding member against a portion of an outer edge of the semiconductor wafer; and rotating the semiconductor wafer while the semiconductor wafer is in contact with the grinding member and while the portion of the outer edge of the semiconductor wafer is immersed in the chemical.

c. Hakomori et al teach removing material from the outer edge of a semiconductor wafer by: rotatably mounting a semiconductor wafer; positioning a grinding member proximate an outer edge of the semiconductor wafer; rotating the semiconductor wafer; rotating the grinding member; applying a chemical to the outer edge; and engaging the rotating grinding member with the outer edge of the rotating semiconductor wafer; or, providing a chemical in a container; rotatably mounting a semiconductor wafer; bearing a grinding member against a portion of an outer edge of the semiconductor wafer; and rotating the semiconductor wafer while the semiconductor wafer is in contact with the grinding member and while the portion of the outer edge of the

Art Unit: 3724

semiconductor wafer is immersed in the chemical (see column 4, lines 26-34, and figure 3), in order to remove imperfections at a wafer outer edge so that the wafers can be handled by handling machinery without causing fine cracks which generate fine particles, or fine contamination particles (see column 2, lines 7-24; column 2, lines 59-67; column 5, lines 1-14; and figures 1 and 2).

d. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have reduced the spin-on glass from the semiconductor wafer of the APA as taught by Hakomori et al by: rotatably mounting the semiconductor wafer; positioning a grinding member proximate an outer edge of the semiconductor wafer; rotating the semiconductor wafer; rotating the grinding member; applying a chemical to the outer edge; and engaging the rotating grinding member with the outer edge of the rotating semiconductor wafer; or, providing a chemical in a container; rotatably mounting a semiconductor wafer; bearing a grinding member against a portion of an outer edge of the semiconductor wafer; and rotating the semiconductor wafer while the semiconductor wafer is in contact with the grinding member and while the portion of the outer edge of the semiconductor wafer is immersed in the chemical, in order to reduce the thickness (i.e. remove imperfections) at the wafer outer edge so that the wafer can be handled by handling machinery

Art Unit: 3724

without causing fine cracks which generate fine particles, or fine contamination particles.

e. Regarding claim 1, Hakomori et al teaches applying the chemical to an outer edge of the wafer(see specifically column 4, lines 17-25).

f. Regarding claims 3, the APA as modified does not disclose securing the semiconductor wafer in a substantially horizontal position to a spindle with a vacuum chuck. However, exactly how the semiconductor wafer is held would have been an obvious matter of choice to one having ordinary skill in the art at the time of the invention, since applicant has not disclose that the specific manner in which the wafer is held provides any stated advantage over the prior art, and it appears that applicant's invention would work equally as well if held in the manner taught by the APA as modified by Hakomori et al.

g. Regarding claims 4,5,17, and 18, the grinding member is oriented in both vertical and horizontal positions, as broadly recited by applicant.

h. Regarding claims 7,8,19, and 20, the APA as modified does not disclose pneumatically controlling or spring-loading the grinding member. However, exactly how the grinding member is caused to engage with the outer edge of the semiconductor wafer would have been an obvious matter of choice to one having ordinary skill in the art at the time of the invention, since applicant has not disclose that the specific manner in which grinding member is

Art Unit: 3724

caused to engage with the outer edge of the semiconductor wafer provides any stated advantage over the prior art, and it appears that applicant's invention would work equally as well if the grinding member is caused to engage with the outer edge of the semiconductor wafer as taught by the APA as modified by Hakomori et al.

4. Claims 2 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over the APA in view of Hakomori et al as applied to claims 1 and 15 above, and further in view of Ang et al.

a. The APA is explained above.

b. The APA does not disclose disengaging the grinding member and rinsing the semiconductor wafer with deionized water.

c. Ang et al discloses that it is well known to disengage a machining member from a semiconductor wafer which has been processed with a chemical, and rinsing the semiconductor wafer with deionized water in order to remove the chemical(see column 5, lines 45-54).

d. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to have further modified the method of the APA by disengaging the grinding member and rinsing the semiconductor wafer with deionized water as taught by in order to remove the chemical therefrom.

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over the APA in view of Hakomori et al as applied to claim 1 above, and further in view of Ball et al.

Art Unit: 3724

- a. The APA is explained above.
- b. The APA does not disclose using a syringe to apply a hydrofluoric acid to approximately a portion of the outer edge that is engaged with the grinding member, applying deionized water to the center of the rotating semiconductor wafer(claim 9).
- c. Ball et al disclose that is it well known to use hydrofluoric acid or water for removing material from a semiconductor wafer(column 6, lines 63-end).
- d. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to have further modified the APA method by applying hydrofluoric acid as the chemical or using water as taught by Ball et al for effectively reducing the thickness of the spin-on glass. Exactly how the acid is applied would have been an obvious matter of choice since applicant has not stated that using a syringe provides any stated advantage over the prior art, and it appears that applicant's invention would function equally as well by applying the acid in the manner taught by the APA as modified by Hakomori et al. Also, the APA as modified do not specifically disclose deionized water, but it would have been obvious to one having ordinary skill in the art at the time of the invention to have used deionized water in order to prevent contamination from any impurities in water.
- i. Regarding claim 10, the APA as modified does not disclose securing the semiconductor wafer in a substantially horizontal



Art Unit: 3724

position to a spindle with a vacuum chuck. However, exactly how the semiconductor wafer is held would have been an obvious matter of choice to one having ordinary skill in the art at the time of the invention, since applicant has not disclose that the specific manner in which the wafer is held provides any stated advantage over the prior art, and it appears that applicant's invention would work equally as well if held in the manner taught by the APA as modified by Hakomori et al.

j. Regarding claims 11 and 12, the grinding member is oriented in both vertical and horizontal positions, as broadly recited by applicant.

k. Regarding claims 13 and 14, the APA as modified does not disclose pneumatically controlling or spring-loading the grinding member. However, exactly how the grinding member is caused to engage with the outer edge of the semiconductor wafer would have been an obvious matter of choice to one having ordinary skill in the art at the time of the invention, since applicant has not disclose that the specific manner in which grinding member is caused to engage with the outer edge of the semiconductor wafer provides any stated advantage over the prior art, and it appears that applicant's invention would work equally as well if the grinding member is caused to engage with the outer edge of the semiconductor wafer as taught by the APA as modified by Hakomori et al.

Art Unit: 3724

*Conclusion*

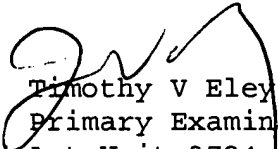
6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. The prior art discloses processing semiconductor wafers.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy V Eley whose telephone number is 703-308-1824. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Allan N Shoap can be reached on 703-308-1082. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9302 for regular communications and 703-872-9303 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1148.

  
Timothy V Eley  
Primary Examiner  
Art Unit 3724

tve  
July 8, 2003